

**SPECIFICATION FOR PRESSURE TESTING OF
DI, CI & PVC PIPE LINES**

Revised on 02-09-2017

Inspection

If stipulated by the purchaser, all materials are subject to inspection and approval at the manufacturer's plant.

Inspection on delivery

All pipe and appurtenances are subject to inspection on delivery. Neither inspection nor failure to provide inspection shall relieve the manufacturer of the responsibility to provide materials meeting the requirements of the contract documents. Materials not conforming to the requirements of this standard shall be made satisfactory or replaced. Pipe or appurtenances that fail to comply with specified tests shall be made satisfactory or replaced.

Workmanship

All pipe and appurtenances shall be tested under pressure for defects and leaks in accordance with these Specifications.

Hydrostatic Testing

The testing methods described in this Specification are specific for water-pressure testing only. These procedures should not be applied for air-pressure testing because of the serious safety hazards involved with compressed air. Also, pipelines intended for buried service should generally be tested with the backfill in place.

Hydrostatic pressure test

Test restrictions

The test pressure shall not be less than 1.25 times the stated working pressure of the pipeline measured at the highest elevation along the test section and not less than 1.5 times the stated working pressure at the lowest elevation of the test section.

The test pressure shall not exceed the thrust restraint design pressure or 1.5 times the pressure rating of the pipe or joint, whichever is less (as specified by the manufacturer)

Valves shall not be operated in either direction at a differential pressure exceeding the rated valve working pressure. A test pressure greater than the rated valve working pressure can result in trapped test pressure between the gates of a double-disc gate valve. For tests exceeding the rated valve working pressure, the test setup should include a provision, independent of the valve, to reduce the line pressure to the rated valve working pressure on completion of the test. The valve can then be opened enough to equalize the trapped pressure with the line pressure, or the valve can be fully opened if desired.

The test pressure shall not exceed the rated working pressure of the valves when the pressure boundary of the test section includes closed, resilient-seated gate valves or butterfly valves.

Test setup and pressurization

Following the installation of any new pipeline, all newly laid pipe or any valved section thereof shall be subjected to a hydrostatic pressure test. Each valved section of pipeline shall be slowly filled with water. When venting air from pipelines, it is important to limit the pipeline fill rate to avoid excessive surge pressures when the water reached the air venting opening (s). The specified test pressure shall be applied using a suitable pump connected to the pipeline. (Note: The specified test pressure shall be based on the elevation of the lowest point of the pipeline or section under test and corrected to the elevation of the test gauge-see test restrictions). Before applying the specified test pressure, air shall be expelled completely from the pipeline section under test. If permanent air vents are not located at all high points, corporation cocks (cocks which are used to give service connections from the main pipeline) shall be installed at these points to expel any air as the line is filled with water. Use of corporation cocks above rated pressure must be at the risk of the user and authorized specifically by the manufacturer. Following removal of any air, the corporation cocks shall be closed and the test pressure applied (at the conclusion of the pressure test, the corporation cocks shall be removed and the pipe plugged, or left in place as required by the contract documents). The pipeline shall be allowed to stabilize at the test pressure before conducting the hydrostatic test. This may require several cycle of pressurizing and bleeding trapped air prior to beginning the test. The hydrostatic test shall be of at least a 2-hr duration. The test pressure shall not vary by more than $\pm 34.5\text{kPa}$ for the duration of the test. Test pressure shall be maintained within this tolerance by adding makeup water through the pressure test pump into the pipeline. The amount of makeup water added shall be accurately measured (liters per hour) by suitable methods and shall not exceed the applicable testing allowance as specified below.

Examination

Any exposed pipe, fittings, valves, hydrants, and joints shall be examined carefully during the pressure test. Any damaged or defective pipe, fittings, valves, hydrants, or joints that are discovered during or following the pressure test shall be repaired or replaced with reliable material, and the test shall be repeated until satisfactory results are obtained.

Testing allowance

Testing allowance shall be defined as the maximum quantity of makeup water that is added into a pipeline undergoing hydrostatic pressure testing, or any valved section thereof, in order to maintain the specified test pressure (after the pipeline has been filled with water and the air has been expelled) No pipe installation will be accepted if the quantity of makeup water is greater than that determined by the following formula.

In metric units,

$$Lm = \frac{SD\sqrt{P}}{794,797}$$

Where

Lm = testing allowance (makeup water), in liters per hour

S = length of pipe tested, in meters

D = nominal diameter of the pipe, in millimeters

P = average test pressure during the hydrostatic test, in kilopascals

When hydrants are in the test section, the test shall be made against the main valve in the hydrant.

Acceptance of installation

Acceptance shall be determined on the basis of testing allowance only. If any test of a new pipeline discloses a testing allowance greater than that specified above, repairs or replacements shall be accomplished. All visible leaks are to be repaired regardless of the allowance used for testing.